OBSOLETE

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OPERATING INSTRUCTIONS
FOR
TYPE 857-A UHF OSCILLATOR
AND
TYPE 857-P1 POWER SUPPLY

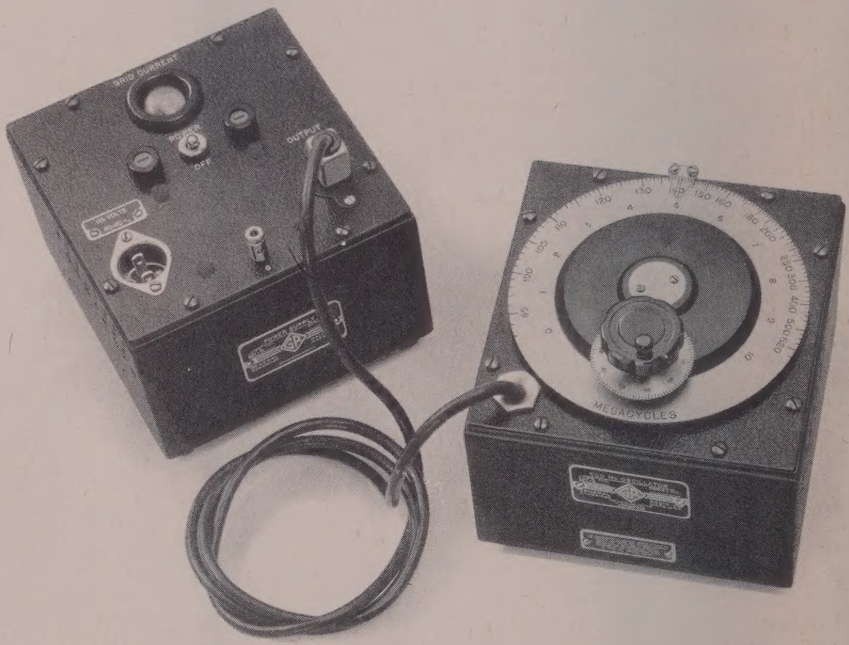
FORM 615-E

GENERAL RADIO COMPANY

CAMBRIDGE 39 MASSACHUSETTS

NEW YORK CHICAGO LOS ANGELES

U. S. A.



FRONTISPIECE. Type 857-A UHF Oscillator and Type 857-P1 Power Supply

OPERATING INSTRUCTIONS
FOR
TYPE 857-A UHF OSCILLATOR
AND
TYPE 857-P1 POWER SUPPLY

1.0 DESCRIPTION - TYPE 857-A UHF OSCILLATOR

1.1 FUNCTION

The Type 857-A UHF Oscillator is a convenient source of radio-frequency power for general laboratory use. It covers a frequency range from 100 Mc to 500 Mc and delivers a maximum output of approximately 0.5 watt.

1.2 CIRCUIT

Figure 1 is a complete circuit diagram.

1.3 TUNED CIRCUIT

The frequency-determining circuit is a butterfly,* in which the capacitance and inductance are varied simultaneously. This circuit makes it possible to cover a wide frequency range with no switching and without moving electrical contacts. While the nominal frequency range is 100 to 500 Mc, the actual operating limits are 93 Mc and 525 Mc.

1.4 DIAL

The main tuning dial is calibrated directly in megacycles. The auxiliary slow-motion dial carries 100 divisions and covers the tuning range in about 10 revolutions. Revolutions of the auxiliary dial are indicated by the inner scale on the main dial.

1.5 VACUUM TUBE

The tube used in this oscillator is a Western Electric Type 316-A. It is shipped separately in the tube manufacturer's carton in order to avoid damage to the thoriated tungsten filament.

1.6 POWER SUPPLY

Power for filament and plate must be supplied externally. The Type 857-P1 Power Supply is designed to operate with this oscillator and its use is recommended. This power unit includes an electron-ray tube to indicate oscillation. Other power sources can be used, however, and the power requirements are listed below.

Filament: 2.5 volts, 3.65 amperes
Plate: 350 volts, 50 milliamperes

For further information, see paragraph 3.2.

1.7 OUTPUT

Output is obtained at a coaxial jack in the side of the cabinet. The output coupling loop is adjustable with respect to the tuned circuit both in distance and orientation.

*Patent Applied For.

2.0 DESCRIPTION - TYPE 857-P1 POWER SUPPLY

2.1 FUNCTION

The Type 857-P1 Power Supply is an a-c operated transformer-rectifier unit designed to furnish plate and filament power to the Type 857-A UHF Oscillator.

2.2 POWER INPUT

115 volts, 40 to 60 cycles. An input voltage of 230 can be used if the primary connections on the power transformer are changed. Total power demand from the line is 50 watts with the Type 857-A UHF Oscillator connected.

2.3 OUTPUT

2.5 volts ac, 3.65 amperes; and 350 volts dc, 50 milliamperes; when the load is a Type 857-A UHF Oscillator.

2.4 VACUUM TUBES

One 5Y3GT Rectifier; one 6E5 Electron-Ray Tube. Both are supplied and are shipped installed in their sockets.

2.5 INTERCONNECTING CABLES

A line-connector cord is supplied. The cable for connection to the oscillator is permanently attached to the oscillator unit.

3.0 INSTALLATION

3.1 TUBES

Install the Western Electric Type 316-A Tube in the oscillator unit securing it with the tube clamp. The power supply tubes are shipped in place.

3.2 POWER SUPPLY

3.21 Type 857-P1: Connect the power unit to the oscillator by means of the cord and plug arrangement supplied.

3.22 Other Power Supplies: When other power units are used, the grid lead of the oscillator should be connected to the center tap of the filament supply through a 1500-ohm resistor. A 10-milliampere meter in this circuit will be found useful as an oscillation indicator. Although the highest allowable plate voltage for the tube is 450 volts at 30 watts plate dissipation, the tube will be damaged if this voltage is applied when the tube is not oscillating. For this reason it is recommended that the plate voltage be not more than 350 volts, which is safe for all conditions of operation.

4.0 OPERATION

4.1

Connect power supply to line and turn on switch.

4.2 OSCILLATION INDICATOR

The electron-ray tube in the Type 857-P1 Power Supply indicates the oscillator grid current. The eye of the tube is closed when oscillations occur and opens when no grid current flows. When a meter is used, the presence of grid current indicates oscillation.

4.3 OUTPUT

Coupling to the load can be adjusted by turning the shield of the output jack between the two positions engraved MAXIMUM and MINIMUM. Further variation can be obtained by screwing the jack in or out through the metal housing. If the load is coupled too closely, oscillations will cease and the grid current will drop to zero, as indicated by the electron-ray tube or a meter.

5.0 MAINTENANCE

5.1 TUBE REPLACEMENT

When the oscillator tube is replaced, any change in calibration that has resulted from differences in tube capacitances can be compensated for by readjusting the rectangular-shaped trimmer condenser between plate and grid.

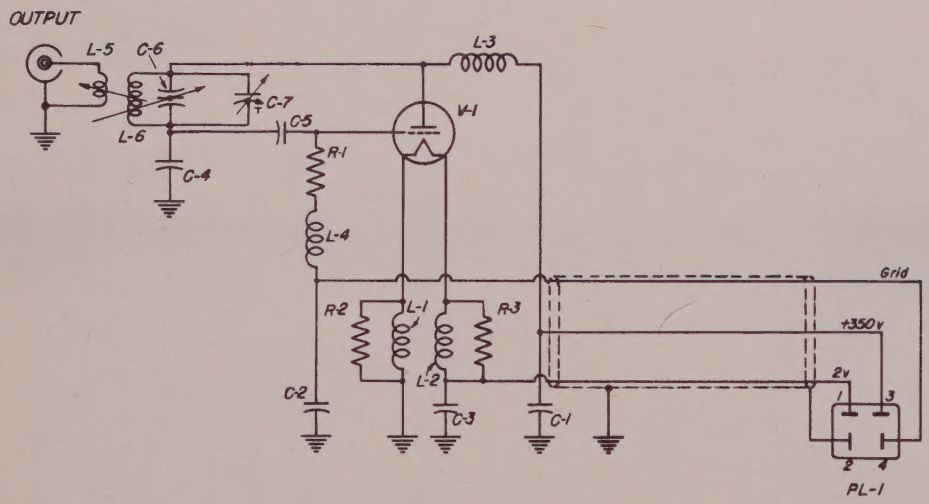


FIGURE 1. Wiring Diagram for Type 857-A UHF Oscillator

PARTS LIST

Resistors

R-1 = 3900 Ω
R-2 = 270 Ω
R-3 = 270 Ω

Tube

V-1 = WE 316-A

Condensers

C-1, C-2, C-3, C-4 } Built in.
C-5 = Approx. 20 μμf
C-6 = Part of Tuning System
C-7 = 857-804 Built in.

Inductors

L-1 = (Wound on R-2) 857-310
L-2 = (Wound on R-3) 857-310
L-3, L-4 } ZCHA-9
L-5 = Pickup Loop, 874-MA
L-6 = Part of Tuning System

Miscellaneous

PL-1 = CDMP-1275

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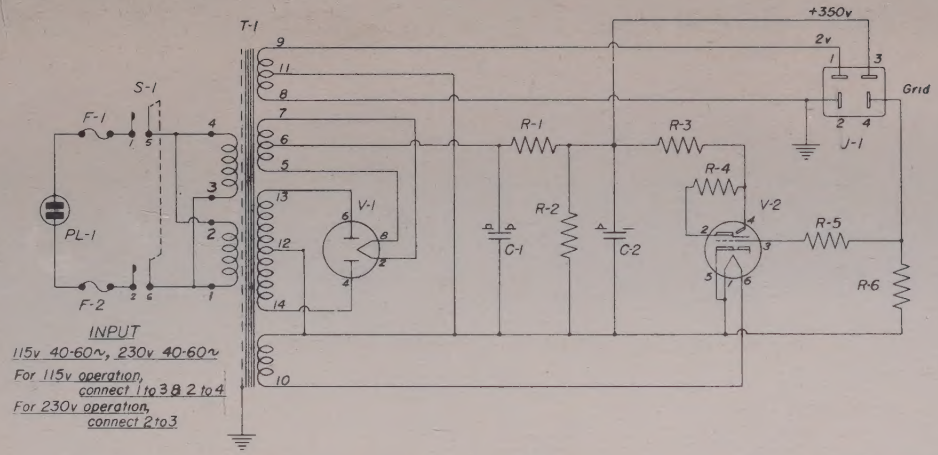

FIGURE 2. Wiring Diagram for Type 857-P1 Power Supply.

PARTS LIST

Resistors

R-1 = 650 Ω
R-2 = 110 kΩ
R-3 = 82 kΩ
R-4 = 1 MΩ
R-5 = 1 MΩ
R-6 = 1500 Ω

Condensers

C-1 = 2 x 20 µf
C-2 = 2 x 20 µf

Transformer

T-1 = 365-445

Tubes

V-1 = RCA Type 5Y3GT
V-2 = RCA Type 6E5

Miscellaneous

S-1 = SWT-333
J-1 = CDMS-1401-4
PL-1 = CDPP-562

For 115 v. 50-60 cycle input:
F-1 = 0.8 amp. Slow Blow 3AG GR FUF-1
F-2 = 0.8 amp. Slow Blow 3AG GR FUF-1

For 230 v. 50-60 cycle input:
F-1 = 0.4 amp. Slow Blow 3AG GR FUF-1
F-2 = 0.4 amp. Slow Blow 3AG GR FUF-1

For 115 v. 40 cycle input:
F-1 = 1.25 amp. Slow Blow 3AG GR FUF-1
F-2 = 1.25 amp. Slow Blow 3AG GR FUF-1

For 230 v. 40 cycle input:
F-1 = 0.6 amp. Slow Blow 3AG GR FUF-1
F-2 = 0.6 amp. Slow Blow 3AG GR FUF-1

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